BULLETIN

OF THE INSTITUTE OF METALS

VOLUME 4 OCTOBER 1957 PART 2

INSTITUTE NEWS

Membership

The Institute's membership on 31 August was 4851.

The new financial year began on 1 September, so that the present is a good time at which to join the Institute. The Secretary will be glad to send particulars of membership, and specimen copies of the monthly *Journal* and *Metallurgical Abstracts* to any potential members whose names and addresses are given to him.

It is hoped that next year (Golden Jubilee year) the membership will be well over 5000.

Forthcoming Meetings of the Institute

Members are asked to note the following dates arranged for meetings of the Institute and of the Powder Metallurgy Joint Group. Details of these meetings will be circulated in due course.

1957

4 Dec. *Inaugural Meeting of the Powder Metallurgy Joint Group*, at Church House, Great Smith Street, London, S.W.1.

10.0 a.m. Coffee.

10.30 a.m. Introductory statement of the aims and activities of the Joint Group, followed by:
Lecture on "Recent Developments in Powder Metallurgy".

11.30 a.m. Informal Discussion on "Developments in the Production and Quality of Metal Powders".
Presentation of short papers on atomization and electrolytic production, followed by a discussion.

1.30 p.m. Buffet lunch.

2.30 p.m. to 5 p.m. Informal Discussion resumed. Presentation of short papers on wet chemical methods, mechanical methods and the production of powders of some reactive metals, followed by a discussion.

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9 Dec. *Symposium on "Vacancies and Other Point Defects in Metals and Alloys"*, arranged by the Metal Physics Committee, at Harwell. Owing to the limited accommodation, attendance will be strictly by registration only. The conference fee will cover meals, transport to and from Oxford, and advance copies of papers.

12.45 p.m. Registration of delegates and issue of badges, followed by lunch.

2.15 p.m. Visit to inspect certain aspects of metallurgical research at the Atomic Energy Research Establishment and to the reactor "Dido".

4.15 p.m. Introductory Lecture by Professor R. W. K. Honeycombe (University of Sheffield), in the Cockcroft Hall.

10 Dec. *Symposium* continued in the Cockcroft Hall, Harwell.

10 a.m. to 4.30 p.m. Presentation of the following papers, followed by discussion, with breaks for lunch and tea:

"Point Defects and Mechanical Properties of Metals and Alloys at Low Temperatures", by Dr. A. H. Cottrell (A.E.R.E., Harwell).

"The Effects of Lattice Defects on Some Physical Properties of Metals", by Dr. T. Broom and Mr. R. K. Ham (University of Birmingham).

"Point Defects and Diffusion in Metals and Alloys", by Dr. W. M. Lomer (A.E.R.E., Harwell).

"Point Defects and Mechanical Properties of Ionic Crystals", by Dr. P. L. Pratt (University of Birmingham).

"Point Defects Near the Surface of a Metal", by Mr. E. C. Williams and Mr. P. C. S. Hayfield (Imperial Chemical Industries, Ltd., Metals Division, Birmingham).

"Point Defects and Mechanical Properties of Metals and Alloys at High Temperatures", by Dr. D. McLean (National Physical Laboratory, Teddington).

6.15 p.m. Session ends. Transport to Oxford, or to Didcot station.

1958

February. *All-Day. Informal Discussion on "Fuel Efficiency in the Melting and Thermal Treatment of Metals"*, arranged by the Metallurgical Engineering Committee, in Birmingham.

February. *All-Day Symposium on "Metallurgical Aspects of Semi-Conductors"*, arranged by the Metal Physics Committee, Birmingham.

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19 March. *All-Day. Informal Discussion on "Developments in the Practice of Compacting and Sintering"*, arranged by the Powder Metallurgy Joint Group, at Church House, Great Smith Street, London, S.W.1.

28 April to 6 May.		*Golden Jubilee Spring Meeting*, in London.
28 April.		Registration of delegates.
29 April.	*Morn.*	Annual General Meeting; induction of new President; presentation of medals, followed by cocktail party.
	Aft.	May Lecture.
	Evg.	Council dinner for distinguished visitors.
30 April.	*Day.*	Two concurrent scientific sessions, including a half-day Symposium on "Plutonium and Techniques for Handling It", arranged by the Nuclear Engineering Committee.
	Evg.	Reception.
1 May.	*Day.*	Two concurrent sessions, including an all-day Symposium on "Advances in Inspection Techniques as Aids to Process Control in Non-Ferrous Metals Production", arranged by the Metallurgical Engineering Committee.
	Evg.	Jubilee Banquet in the Great Room, Grosvenor House.
2 May.		Visits to works and laboratories in London and the surrounding areas.
5 & 6 May.		Provincial visits to works for members and visitors.
22–26 September.		*Golden Jubilee Autumn Meeting*, in Birmingham.
Autumn.		*All-Day Discussion on "The Powder Metallurgy of Ceramic-Metal Materials"* (based on original research papers), arranged by the Powder Metallurgy Joint Group, London.

Monograph No. 7: "The Solidification of Castings"

A new edition of the Institute's Monograph "The Solidification of Castings" has recently been published. The author is Mr. R. W. RUDDLE, formerly Head of the Melting and Casting Section of the British Non-Ferrous Metals Research Association and now Technical Manager of Foundry Services, Inc., Columbus, Ohio.

The purpose of the book is critically to survey and summarize the researches carried out in the field of solidification of castings and to present the results in a form that can be readily assimilated by the reader.

The great activity recently shown by research workers in this field, and the large number of papers which have appeared since the first edition was published in 1950, have necessitated a complete revision, and little of the original text remains. In addition, the scope of the book has been enlarged to some extent, researches on the mechanism, as opposed to the kinetics, of solidification being dealt with in much greater detail; the discussion of experimental technique has also been extended. The result of these changes is that the present edition is over three times the length of the original one.

Copies may be obtained through booksellers or from the Institute, price 42*s*. ($6.50), post free. Members may obtain one copy (through the Institute only) at 25*s*. ($3.75), post free.

Official Representation of the Institute

Professor F. A. FORWARD, a Corresponding Member to the Council for Canada, was the official delegate of the Institute to the Sixth Commonwealth Mining and Metallurgical Congress, which opened in Vancouver on 8 September.

Dr. IVOR JENKINS, Vice-President, will be the official delegate of the Institute at the Third World Metallurgical Congress, organized by the American Society for Metals, at Chicago from 2 to 8 November.

Mr. F. H. KEATING has accepted an invitation to represent the Institute on the Advisory Committee on Metallurgy of King's College, University of Durham.

Election of Members

The following 1 Overseas Sustaining Member, 33 Ordinary Members, 1 Junior Member, and 2 Student Members were elected on 30 August 1957:

As Overseas Sustaining Member

CENTRE TECHNIQUE DES INDUSTRIES DE LA FONDERIE, 12 Avenue Raphaël, Paris (16e), France.

As Ordinary Members

ALMAR-NAESS, Almar, M.Sc., Managing Director, Rontgenkontrollen, Blindern, Oslo, Norway.

ALTENPOHL, Dieter, Dr.rer.nat., Physical Metallurgist, Aluminium-Walzwerke Singen G.m.b.H., Singen/Hohentwiel, Germany.

ASHDOWN, Roy James, A.M.I.Mech.E., Engineer, A.E.I.–John Thompson Nuclear Energy Company, Radbroke Hall, Knutsford, Cheshire.

ATTWOOD, Albert Norman, Technical Director, Accles and Pollock, Ltd., Oldbury, Birmingham.

BEBBINGTON, John, F.L.A., City Librarian and Information Officer, Central Library, Surrey Street, Sheffield.

BIRD, Arthur, Managing Director, Basildon Metal Powder Parts, Ltd., Church Road, Thunderley, Essex.

BRADSHAW, James Ronald, A.R.I.C., Works Research and Development Chemist, Tungsten Manufacturing Co., Ltd., 112A Junction Road, Upper Holloway, London, N. 19.

BROOKS, Carson L., B.S., Assistant Director, Metallurgical Research Laboratories, Reynolds Metals Company, 4th and Canal Streets, Richmond 19, Va., U.S.A.

CAILLAT, Roger, Doct. ès Sc.phys. Chef du Service de Chimie des Solides, Centre d'Etudes Nucléaires de Saclay, Commissariat à l'Energie Atomique, Boite Postale No. 2, Gif-sur-Yvette (S. et O.), France.

COLLARI, *Cav. Uff. Professore* Nello, Professore di Chimica Applicata e di Metallurgia e Metallografia, Istituto di Metallurgia, Palazzo delle Scienze, via Ospedale, Cagliari, Italy.

CORSINI, Neri, Dott.Chim.Ing. (President, Powder Metallurgy Centre, Associazione Italiana di Metallurgia), Via Pantano 2, Milano, Italy.

EDGAR, Carroll, A.M.I.Mech.E., Assistant Professor, Department of Mechanical Engineering, University of Delaware, Newark, Dela., U.S.A.

FUSCHILLO, Nicholas, M.S., Ph.D., Section Chief, Solid-State Division, Franklin Institute Laboratories, 20th and Parkway, Philadelphia 3, Pa., U.S.A.

GOLDSMITH, Maurice, B.Sc., Director, Science Information Office, 5 Great James Street, London, W.C.1.

JORDAN, Kenneth Arnold, L.I.M., Experimental Officer, Materials Section, Post Office Engineering Department, Fordrough Lane, Birmingham 9.

KOHLMEYER, *Professor* Ernst Justus, Dr.-Ing.e.h., o. Professor Emeritus (Metallurgie), Technische Universität Berlin, Im Hornisgrund 3, Berlin-Grunewald, Germany.

LACROIX, Roger Claude, Ing., Chef du Laboratoire de Recherches, Comptoir Lyon-Alemand, S.A., 13 rue de Montmorency, Paris (3e), France.

LOEBICH, Otto, Dr.phil., Leiter des Metall-Laboratoriums, Deutsche Gold und Silber Scheideanstalt (DEGUSSA), Leipziger Strasse 10, Hanau (Main), Germany.

MCCUSKER, Neal, Commissioner for Railways, 19 York Street, Sydney, N.S.W., Australia.

MCKINSEY, Charles Robert, B.S., Research Metallurgist, Metals Research Laboratories, Electro-Metallurgical Company, 4625 Royal Avenue, Niagara Falls, N.Y., U.S.A.

PARIS, René Antoine, Doct. ès Sc., Chef des Services de Recherches, Pechiney, Compagnie de Produits Chimiques et Electrométallurgiques, 23 rue Balzac, Paris (8e), France.

PLATTNER, Friedrich Wilhelm, Dipl.Ing., Technischer Direktor, Rheinische Blattmetall A.G., Kölnerlandstrasse, Gravenbroich/Ndrrh., Germany.

RUSSELL, John V., M.S., Assistant Chief Metallurgist, Chicago District, Republic Steel Corporation, Chicago 17, Ill., U.S.A.

RYCHTER, Walter, Quim., Gerente, Solwir Argentina, Paz Soldan 4940, Buenos Aires, Argentina.

SIDES, William E., B.A., Superintendent of Industrial Engineering, Noranda Copper and Brass, Ltd., P.O. Box 1238, Place d'Armes, Montreal, P.Q., Canada.

SMITH, C. Gordon, M.A., A.M.I.E.E., Development Officer, Development and Research Department, The Mond Nickel Co., Ltd., Thames House, Millbank, London, S.W.1.

SMITH, Cyril Joseph, Works Metallurgist, Birmetals, Ltd., Woodgate Works, Quinton, Birmingham 32.

STARR, Clive, Smelting Shop Supervisor, Mitcham Smelters, Ltd., Rometal Works, Red House Road, Croydon, Surrey.

STOHR, Jacques André, Ing., Chef du Service de Technologie, Centre d'Etudes Nucléaires de Saclay, Commissariat à l'Energie Atomique, Boite Postale No. 2, Gif-sur-Yvette (S. et O.), France.

TANAKA, Eihachiro, Assistant Professor, Research Institute for Iron, Steel, and Other Metals, Tohoku University, Katahira-cho, Sendai, Japan.

TORDEUX, Michel, Ing., Chef du Bureau de Documentation, Centre Technique des Industries de la Fonderie, 12 Avenue Raphaël, Paris (16e), France.

VAN VINCKENROY, Victor François Marie, Ing.Civ.Mines, Ing.Civ.Elect., Administrateur-Directeur, Centre d'Information du Cobalt, 35 rue des Colonies, Brussels, Belgium.

WILSON, James Connelly, B.S., Senior Metallurgist and Radiation Metallurgy Group Leader, Solid-State Division, Oak Ridge National Laboratory, (Union Carbide Nuclear Co.), Box " X ", Oak Ridge, Tenn., U.S.A.

As Junior Member

MACBRIDE, (Miss) Fiona, B.A., M.Sc., Special Investigator, High Duty Alloys, Ltd., Slough, Bucks.

As Student Members

BEECH, John, Undergraduate, Department of Metallurgy, University of Sheffield.

O'HARA, Sydney, B.Sc., A.R.C.S.T., Student Demonstrator, Department of Metallurgy, Royal College of Science and Technology, George Street, Glasgow C.1.

PERSONAL NOTES

PROFESSOR ALLISON BUTTS has retired from his position as Head of the Department of Metallurgy at Lehigh University, Bethlehem, Pa. He had taught there for 41 years.

DR. L. H. CALLENDAR has set up a consulting practice at 26 West Lodge Avenue, London, W.3 (ACOrn 7912). He will specialize in planning research and development and dealing with problems in metallurgy and electrochemistry (including corrosion), rubber, and plastics.

DR. S. G. CLARKE has been elected Chairman of the Corrosion Group of the Society of Chemical Industry for the year 1957–58.

PROFESSOR C. W. DANNATT has received the title of Professor Emeritus on his retirement from the Chair of Metallurgy at the Imperial College of Science and Technology.

DR. J. LEJA has left the Department of Colloid Science, Cambridge, to take up an appointment as Assistant Professor of Metallurgy at the University of Alberta, Edmonton, Canada.

MR. J. F. PAIGE has retired from the position of Managing Director of William Mills, Ltd., Wednesbury.

MR. G. B. PARTRIDGE has been appointed Development Officer of William Mills, Ltd., Wednesbury.

PROFESSOR A. M. PORTEVIN has been made a Grand' Ufficiale al Merito della Repubblica Italiana.

MR. R. L. RICHARDS has left the British Standards Institution to become Manager of the Federation of Rhodesia and Nyasaland Standards Association.

DR. G. A. ROBERTS, Vice-President, Technology, of the Vanadium Alloys Steel Company, has been elected President and Chairman of the Board.

MR. W. J. SULLY, Joint Managing Director of Sterling Metals, Ltd., has been appointed to the board of Birmid Industries, Ltd.

Deaths

The Editor regrets to announce the death of:

DR. RICHARD WILLIAM BAILEY. Consultant Engineer, Metropolitan-Vickers Electrical Co., Ltd., Manchester, on 4 September 1957.

MR. DANIEL MACFARLANE DAVIDSON, formerly Chairman and Managing Director of the East Rand Engineering Co., Ltd., Germiston, Transvaal, on 7 July 1957.

MR. HEINRICH KRIEGSHEIM, formerly President of the Permutit Company, New York, on 22 April 1957.

DR. IRVING LANGMUIR on 16 August at the age of 76. For more than 40 years he was on the staff of the General Electric Company at Schenectady, N.Y., until his retirement in 1950. He was elected an Honorary Member of the Institute in 1943.

MR. GEOFFREY WILLIAM PRESTON, formerly Manager of the Copper Development Association, on 17 June 1957.

OBITUARY

Mr. J. W. Berry

Mr. Joseph Wallace Berry, Deputy Managing Director of Birmid Industries, Ltd., and Joint Managing Director of the Birmingham Aluminium Casting (1903) Co., Ltd., Smethwick, died at Stourbridge on 5 August 1957 following an operation. He was 67.

A native of West Bromwich and educated at the local secondary school, Mr. Berry served an apprenticeship in the lighthouse and engineering section of the Spon Lane glassworks of Chance Bros., Ltd. He subsequently held various executive positions in the engineering field before entering the metallurgical industry as Technical Adviser to Stourbridge Rolling Mills. Here he was responsible for installing the first continuous bright-annealing furnace in Europe. He also investigated cold-rolling practice in Europe and the United States and studied the fundamentals of cold deformation. He was a founder member of a committee set up by the Motor Industries Research Association to investigate the principles and problems of deep drawing.

In 1939 Mr. Berry was appointed Assistant General Manager of Birmetals, Ltd., Woodgate, and he moved to Smethwick in 1942 as Works Director of Birmingham Aluminium Casting (1903) Co., Ltd., being appointed Joint Managing Director in 1948. He was subsequently appointed to the board of the parent company, Birmid Industries, Ltd., and his appointment as Deputy Managing Director of that Company was announced only a short time before his death.

Mr. Berry was also Chairman of Dartmouth Auto Castings, Ltd., a Director of Birmid Auto Castings Pty., Ltd., Geelong, Australia, and a Director of Cylinder Components, Ltd., Kings Norton, Birmingham.

Keenly interested in technical training and specialized education for entrants to the industry, Mr. Berry was for some years associated with the Wolverhampton and Staffordshire Technical College. He was also a member of the West Bromwich, Smethwick, and Oldbury Joint Committee for the recruitment and training of youth in engineering, and became its Chairman in 1951.

Mr. Berry was one of the moving spirits behind Birmid Industries' apprenticeship scheme, which has been regarded as a model of its kind throughout the industry. He encouraged and supported works' social and welfare activities, in particular those associated with the foremen and supervisory staff.

For many years Mr. Berry was Chairman of the Examinations Committee and of the Examination Board of the Institution of Production Engineers. He did much to promote the idea of a National Certificate in Production Engineering, and when this was eventually accepted by the Ministry of Education, he was, on its inauguration, appointed alternate chairman of the controlling committee.

Mr. Berry was a Member of Council of the Institution of Production Engineers for some 20 years and President of the Birmingham Branch for two years. He was a Past-President of the West Bromwich, Smethwick, and District Manufacturers' Association, and a member of the Management Board of the Birmingham and District Engineering and Allied Employers' Association. He had been a Member of Council of the Institute of Metals since April 1956.

Mr. C. F. Nagel, Jr.

Mr. Conrad Frederick Nagel, Jr., retired Vice-President of the Aluminum Company of America, died on 5 July at his home in Pittsburgh, Pa., after a long illness. Mr. Nagel had retired on 1 January, after more than 41 years' service with Alcoa.

A native of New York and a graduate of Cornell University, where he received his degree in chemistry, Mr. Nagel joined Alcoa in 1915. One of his initial developments was a process for producing "feathered" aluminium—a fine, granular powdered aluminium used in explosives.

He entered military service in 1917 and served for two years as an infantry lieutenant, part of the time in France.

In July 1919, Mr. Nagel returned to Alcoa and was put in charge of the Process and Products Division of the Company's Technical Direction Bureau. Four years later he was made Assistant Technical Director and, in 1928, was appointed Head of the Fabricating Division's newly-formed metallurgical department.

Mr. Nagel became Chief Metallurgist for Alcoa in 1944, and was elected a Vice-President in 1952. He had also served as Chairman of Alcoa's Technical Committee, which guides and supervises all company technical activities, and of the Research Policy Committee, which directs and oversees the research programme.

One of Mr. Nagel's outstanding accomplishments was that of establishing aluminium as a major material for aircraft, by determining and eradicating causes of excessive corrosion which threatened the metal's future in that field in the early twenties.

The author of numerous articles and of a book dealing with aluminium in the aircraft industry, Mr. Nagel was a member of the Institute of Metals (since 1925), Institute of Aeronautical Sciences, American Institute of Mining and Metallurgical Engineers, American Society for Metals, National Aeronautic Association, and American Ordnance Association.

LETTER TO THE EDITOR

Mass-Spectrographic Identification of Impurities in Aluminium

In an investigation involving the preparation of aluminium single crystals by the strain-anneal method, minute amounts of impurities in the sheet material were found to affect strongly both the recrystallization process and the perfection of the crystals obtained in the final stage. In studies of the properties of metals, it is becoming increasingly necessary to determine the nature and the amounts of the impurities present in concentrations of the order of 1 p.p.m.

For qualitative analysis of the impurities present in aluminium, a vacuum-spark double-focusing mass spectrograph of the Mattauch-Herzog type has proved to be a quick and sensitive tool; the instrument used for the present work was a Metropolitan-Vickers mass spectrometer M.S.7. This has been described briefly byWaldron.[1] Positive ions representative of the composition of the sample being analysed are produced in an evacuated ion-source assembly by a high-voltage spark between specimen rods (dia. = 1–2 mm.) of the material. These ions undergo energy and momentum analysis and can then be focused according to their mass on a photographic plate in the magnetic analyser. The design of the instrument allows a range of elements with atomic masses from 6 to 250 to be recorded in one exposure. By means of a rack mechanism, ten exposures may be recorded on the same photographic plate without loss of vacuum. Fig. 1 shows such a series of timed exposures of increasing duration recorded on an Ilford Q2 plate. The spectrum is that of a single crystal made from super-purity aluminium with the addition of 0·15% copper (i.e. within the solubility limit) The elements that were positively identified by the mass spectrometer are listed in Table I. Emission spectrographic analyses of the same specimens were made with a Hilger medium spectrograph for comparison; the elements found, and normal limits of detection, are included in Table I. All the elements found in the emission spectra are easily detected in the mass spectra. The greater sensitivity of the mass-spectrographic method is emphasized by the fact that whereas in the mass spectra lines corresponding, for example, to the elements lead, arsenic, and antimony were positively identified, these elements could not be detected on the emission-spectrographic plates, despite carefully repeated analyses with special attention concentrated on these elements.

No attempt has been made yet to undertake accurate quantitative analysis of aluminium single crystals by the mass spectrometer. It should be emphasized that the mass spectra of metals and their alloys are much less difficult to interpret than the emission spectra, and results are, in general, more quickly and easily obtained.

TABLE I.—*Comparison of Mass- and Emission-Spectrographic Analyses.*

Element	Mass No. of Most Abundant Isotope	Sample I		Emission
		Mass	Emission	Limit of Detection in D.C. Arc, p.p.m.§
Th	232	★	†	1000
Bi	209	★	†	3
Pb	208	★	†	30
W	184	★	†	100
Sm	152	★	†	100
Nd	142	★	†	100
Ce	140	★	†	300
La	139	★	†	30
Ba	138	★	†	30
Sb	121	★	†	30
Sn	120	★	†	10
Cd	114	★	†	10
Ag	107	★	†	10
As	75	★	†	30
Ga	69	★	†	3
Zn	64	★	★	100
Cu	63	★	★	10
Fe	56	★	★	3
Mn	55	★	★	3
Ca	40	★	★	1
K	39	★	†	10
Cl	35	★	‖	
S	32	★	‖	
P	31	★	†	1000
Si	28	★	★	10
Mg	24	★	★	10
Na	23	★	†	1
F	19	★	‖	
B	11	★	†	10

★ Detected. † Not detected. ‖ Not detectable by normal emission-spectrographic techniques.

§ Normally accepted limits of detection in D.C. arc emission-spectrographic analysis. Limits of detection by the mass spectrometer have not yet been determined, but a preliminary investigation indicates that for the above elements they lie between 0·05 and 1 p.p.m.

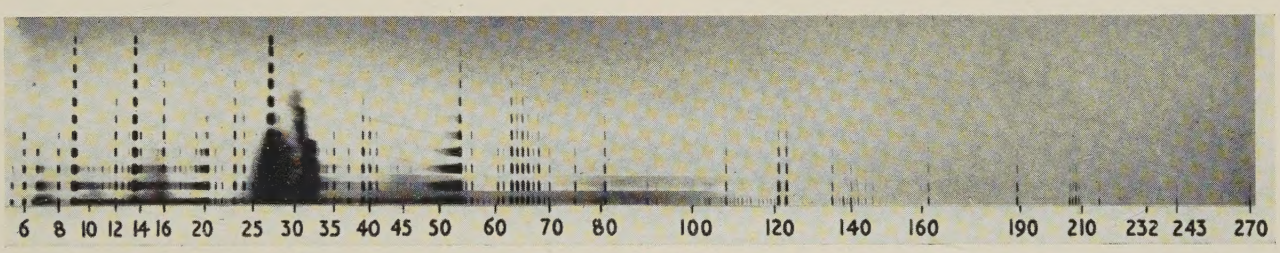

FIG. 1.—Mass-spectrograms of super-purity aluminium containing 0·15% copper.

We wish to express our sincere thanks to Mr. R. D. Craig of the Research Department, Metropolitan-Vickers Electrical Co., Ltd., for carrying out the mass-spectrographic analyses, to Dr. G. P. Barnard, of the National Physical Laboratory, for valuable discussion, and to the Director, Chemical Research Laboratory, for permission to publish this letter.

SVEN FLOBERG
ANITA FURSEY

Chemical Research Laboratory,
Teddington,
Middlesex.

REFERENCE

1. J. D. Waldron, *Research*, 1956, **9**, 306.

JOINT ACTIVITIES

Capper Pass Awards

The Adjudicating Committee, representing the Councils of the Institution of Mining and Metallurgy and of the Institute of Metals, has made the following Capper Pass Awards in respect of papers published in the *Transactions* of the Institution of Mining and Metallurgy and the *Journal* of the Institute of Metals for the year 1956.

£120 to Dr. J. M. FLETCHER, Dr. D. F. C. MORRIS, and Mr. A. G. WAIN for a paper on " Outline of a Solvent Extraction Process for the Purification of Niobium from Ores or from Ferro-Niobium ".

Fifty Guineas to Mr. J. A. GRAINGER for a paper on " The Deep Drawing and Spinning of Sheet Metal, with Particular Reference to Non-Ferrous Materials ".

Fifty Guineas to Mr. J. FIELDING for a paper on " Rubber Pressing ".

These Awards are made from a fund placed at the disposal of the Councils of the two Societies by the Directors of Capper Pass and Son, Ltd., for the encouragement of the publication of scientific and technical papers dealing with processes and plant used in extraction metallurgy and on the subject of assaying and on processes and plant used in all branches of the non-ferrous metal industry.

NEWS OF ALLIED SOCIETIES

Associazione Italiana di Metallurgia

At a meeting on 25 May, the following were elected as officers of the Associazione for the ensuing year:

President: Dott. Prof. Guido CALBIANI.

Vice-Presidents: Dott. Prof. Felice DE CARLI and Dott. Ing. Giovanni PORRO.

Secretary to the Council: Dott. Giuseppe TESTERO.

Members of Council: Dott. Ing. Giancarlo ANSELMETTI, Dott. Ing. Prof. Aldo BARTOCCI, Dott. Ing. Rosario CARMINA, Dott. Prof. Leo CAVALLARO, Dott. Ing. Prof. Raoul DUPUIS, Dott. Ing. Riccardo LAMPUGNANI, Dott. Ing. Stefano MENGHI, Dott. Giovanni ODONE, Dott. Ing. Giulio PESCATORI, Dott. Ing. Alessandro REGGIORI, Dott. Ing. Giovanni ROLANDI, Dott. Prof. Francesco SAVIOLI, Dott. Ing. Vittorio SCALISE, and Dott. Ing. Domenico TACCONE.

Treasurer: Dott. Ing. Alberto BARONI.

OTHER NEWS

Chair of Metallurgy at Oxford

MR. ISAAC WOLFSON, Chairman and Managing Director of Great Universal Stores, Ltd., has given the University of Oxford £65,000 with which to establish a Chair of Metallurgy. The gift will be formally accepted in Congregation on 22 October, when it will be proposed that the new Chair shall bear the donor's name.

The present Reader in Metallurgy at Oxford is Dr. W. HUME-ROTHERY, F.R.S., whose researches over the last 30 years into alloy theory are well known.

Symposium on the Future of Non-Ferrous Mining in Great Britain and Ireland

The Institution of Mining and Metallurgy and the United Kingdom Metal Mining Association are to hold a Symposium in London during September 1958 on " The Future of Non-Ferrous Mining in Great Britain and Ireland ".

It is proposed to discuss the known and prospective occurrences of minerals other than iron and coal in Great Britain and Ireland, and the problems, both technical and economic, affecting their exploration and development.

Papers have been promised on the economic geology of the mineralized areas, on the working of existing non-ferrous metal mines, and on mineral rights, mining taxation, and metal prices.

International Deep Drawing Research Group

The problem of tests for the assessment of the suitability of sheet metals for deep-drawing and forming operations has been the subject of investigations in several countries, and it has been felt by some that researches in this field would benefit from international co-operation. Accordingly, a meeting of representatives of research organizations in Belgium, Chile, France, Western Germany, Great Britain, Holland, and Sweden was held in Amsterdam on 19 and 20 March to discuss the matter.

As a result of this meeting, an informal co-ordinating body has been formed with the aim of promoting co-operation in further research on deep drawing and the cup-forming test on the basis of a unified test procedure. To this end information and unpublished reports on work in progress in individual countries will be circulated to the members, meetings will be held from time to time for the purpose of reviewing progress, and occasional joint communications will be issued.

Membership of the body, which is entitled the International Deep Drawing Research Group, is open to all organizations interested in furthering the aims of the Group. Enquiries should be addressed to: Ref.—I.D.D.R.G., The Technical Secretary, Mechanical Working Division, British Iron and Steel Research Association, 11 Park Lane, London, W.1.

A New Translation Service

Enquiries have shown that there is a growing need in the iron and steel industry for improved facilities for obtaining translations of foreign technical literature, including Russian.

The Iron and Steel Institute has been investigating this problem and, at the suggestion of the British Iron and Steel Research Association, has agreed to organize a Co-operative Translation Service.

Plans are already well advanced, and a number of companies in the industry are collaborating with the Institute in setting up the Service. The scheme will benefit the industry in two ways: not only will the range of available translations of technical papers be considerably widened, but also much unnecessary duplication of effort will be avoided.

Translations prepared by individual companies will be passed to the central " pool ", and these will be supplemented by translations from other sources. An index is currently being compiled of those translations made since 1950 which are still available, and lists of newly produced material and news of translations in course of preparation will be circulated among their members and published at regular intervals by B.I.S.R.A., the British Iron and Steel Federation, and the Institute itself.

Although primarily devised to serve the needs of the iron

and steel industry, the new Service will nevertheless be available to all who wish to take advantage of the facilities offered. An agreed scale of charges has been laid down which includes provision for substantial reductions where a number of copies of any individual paper are required.

British Non-Ferrous Metals Federation

At the twelfth Annual General Meeting of the British Non-Ferrous Metals Federation, the following were elected as officers: *President*, The Hon. John GRIMSTON, M.P. (Enfield Rolling Mills, Ltd.); *Vice-Presidents*, Dr. Maurice COOK (Imperial Chemical Industries, Ltd., Metals Division); Mr. W. W. DOLTON (Delta Metal Co., Ltd.); Mr. W. R. D. MACDONALD (The Yorkshire Copper Works, Ltd.), and Mr. F. WAINE, J.P. (British Insulated Callender's Cables, Ltd.). Mr. A. L. JOHNSON (Richard Johnson, Clapham and Morris, Ltd.) was re-elected Treasurer.

The Lead Development Association

The Lead Development Association announces that the affairs of the Lead Sheet and Pipe Council have been integrated with those of the L.D.A. with effect from 1 July 1957. The L.D.A. has formed a Lead Sheet and Pipe Section, on the Committee of which members nominated by the Lead Sheet and Pipe Manufacturers Federation will serve.

The Corday-Morgan Commonwealth Fellowship

Applications are invited from citizens of any country within the British Commonwealth for the Corday-Morgan Commonwealth Fellowship. This will be awarded for post-doctorate (or equivalent) study in any branch of chemistry. It will be tenable for one year in some part of the British Commonwealth other than that in which the candidate received his scientific education, at any university, research institution, or other place of study approved by the Corday-Morgan Memorial Fund Executive.

The value of the Fellowship will be £700 per annum, but additional allowances may be granted in appropriate cases for travel, university fees, &c. The appointment will date from 1 October 1958 or such other date as may be arranged.

The appointment will be made by the Executive not later than 1 June 1958. Application forms and copies of the General Regulations governing the Award may be obtained from: The Secretary, Corday-Morgan Memorial Fund Executive, c/o The Chemical Society, Burlington House, London, W.1. Applications must be received by the Secretary not later than 1 March 1958.

The Chemical Society Research Fund

The Research Fund of the Chemical Society provides grants for the assistance of research in all branches of chemistry. About seven hundred pounds per annum is available for this purpose. Applications for grants will be considered in November next and should be submitted on the appropriate form not later than Thursday, 14 November 1957. Applications from Fellows will receive prior consideration.

Forms of application, together with the regulations governing the award of grants, may be obtained from the General Secretary, The Chemical Society, Burlington House, London, W.1.

DIARY

Local Sections and Associated Societies

7 October. East Midlands Metallurgical Society. Presidential Address, by N. S. Angus. (Nottingham and District Technical College, Shakespeare Street, Nottingham, at 7.30 p.m.)

8 October. South Wales Local Section. "Pure Metals", by Dr. J. C. Chaston. (Department of Metallurgy, University College, Singleton Park, Swansea, at 6.30 p.m.)

9 October. Manchester Metallurgical Society. Presidential Address, by Dr. K. M. Entwistle. (Manchester Room, Central Library, Manchester, at 6.30 p.m.)

10 October. Birmingham Local Section. "The Production of Wrought Forms in Titanium and Titanium Alloys", by J. R. Crane. (The College of Technology, Gosta Green, Birmingham, at 6.30 p.m.)

10 October. Liverpool Metallurgical Society. Presidential Address, by J. S. W. Graham. (Liverpool Engineering Society, The Temple, Dale Street, Liverpool, at 7.0 p.m.)

23 October. Liverpool Metallurgical Society. Visit to Lancashire Steel Corporation, Irlam.

23 October. Manchester Metallurgical Society. "Early Metallurgy", by Dr. F. C. Thompson. (Manchester Room, Central Library, Manchester, at 6.30 p.m.)

25 October. North East Metallurgical Society. "Metals Used in the Jewellery and Silverware Industry", by Miss Dorothy Pile. (Cleveland Scientific and Technical Institution, Corporation Road, Middlesbrough, at 7.15 p.m.)

6 November. Manchester Metallurgical Society. "Weldable High-Strength Steels", by Dr. K. J. Irvine. (Manchester Room, Central Library, Manchester, at 6.30 p.m.)

7 November. Birmingham Local Section. "Tool Steel Development", by A. P. T. Taylor Gill. (The College of Technology, Gosta Green, Birmingham, at 6.30 p.m.)

7 November. East Midlands Metallurgical Society. "Rare Metals", by Dr. J. C. Chaston. (Nottingham and District Technical College, Shakespeare Street, Nottingham, at 7.30 p.m.)

7 November. Leeds Metallurgical Society. "The Development of Electronics for Process Control and Inspection", by C. H. Gould. (Yorkshire Copper Works, Ltd., Leeds, followed by works visit.)

7 November. London Local Section. "Refractories", by Dr. James White. (Royal School of Mines, South Kensington, London, S.W.7, at 7.0 p.m.)

11 November. Scottish Local Section. "Vacuum Metallurgy", by Dr. F. C. Weil. (Institution of Engineers and Shipbuilders in Scotland, 39 Elmbank Crescent, Glasgow, C.2, at 6.30 p.m.)

12 November. Oxford Local Section. "Recent Advances in Ironmaking", by a member of B.I.S.R.A. staff. (Cadena Café, Cornmarket Street, Oxford, at 7.0 p.m.)

APPOINTMENTS VACANT

BIRLEC, LTD., have a vacancy on their research department staff for a qualified metallurgist (degree, A.I.M., or equivalent standard) capable of supervising a section of the laboratory. The work is concerned with development and application of industrial heat-treatment furnaces and related equipment. Apply Personnel Manager, Birlec, Ltd., Tyburn Road, Birmingham 24.

FULMER RESEARCH INSTITUTE, LTD., invite applications from METALLURGISTS to work *inter alia* on the Physical Metallurgy of Uranium and Zirconium Alloys and Precipitation in Aluminium- and Copper-base Alloys.

For the more senior posts candidates should have Honours Degree and preferably some postgraduate experience. For others, candidates should have experience in laboratory practice and should preferably hold qualification of A.I.M. standard.

Salaries will be up to £1000 p.a. and will depend on qualifications and experience. Superannuation Scheme available. Apply to: Director of Research, Fulmer Research Institute, Stoke Poges, Bucks.

GRADUATE CHEMIST required for senior position involving physical chemical research on problems connected with application of aluminium, especially surface reactions, metal finishing, lubrication, and lacquer adhesion. Previous experience in this field not essential. A Pension and Life Assurance Scheme in operation. Apply to: Personnel Officer, Aluminium Laboratories Limited, Banbury, Oxon.

HIGH DUTY ALLOYS, LTD., Castings Division, Slough, Bucks., require a Metallurgist with a degree or equivalent qualification. Candidates should preferably have some experience in production of light alloy sand and die castings. This is a senior appointment, and the starting salary will be on a generous scale commensurate with qualifications and experience. Contributory Pension Scheme in operation. Write, giving full details of qualifications and experience, which will be treated in strict confidence, to the Company Personnel Manager.

METALLURGICAL ENGINEER required by Research Association in the Midlands. Successful applicant will be required to advise on metallurgical problems submitted by member firms and to be able to discuss such problems at executive level. Membership of professional institution and ability to work on own initiative essential. Duties will include visits to engineering firms throughout the country. F.S.S.U. Superannuation Scheme. Send full details, including age, qualifications, experience, and present salary, in confidence to Box No. 436, Institute of Metals, 17 Belgrave Square, London, S.W.1.

METALLURGIST, minimum qualification A.I.M., or equivalent, is required to take charge of the Metallurgy Section of one of the most up-to-date and progressive Heavy Pressure Vessel Works in the country, part of a world-wide Group of Companies. There is a new, elaborately equipped laboratory, and the responsibilities of the post include technical control of radiography, heat-treatment, and mechanical testing; the development of welding techniques with ferrous and non-ferrous metals, including clad steels; and research and investigation on new and existing products in manufacture and service. Only applicants justifying a good starting salary can be considered, and experience of first-class welded work is essential. A contributory pension scheme and extensive recreation facilities are available. Apply in confidence to: Chief Engineer, Edwin Danks and Co. (Oldbury), Ltd., Oldbury, near Birmingham.

METALLURGISTS required for control and development work on the production of non-ferrous metals. A degree or equivalent qualification is necessary with industrial experience. The posts have ample scope for advancement for people with initiative. Adequate salary based on qualifications and experience; contributory pension scheme; assistance with living accommodation after short period of service. Apply in confidence to Labour Manager, Enfield Rolling Mills, Ltd., Brimsdown, Enfield, Middx.

METALLURGISTS

THE GLACIER METAL COMPANY, LTD., has two vacancies in its **RESEARCH & DEVELOPMENT ORGANIZATION:**

1. For one of these the person appointed will be in charge of a section of five members with responsibility for fundamental research into bearing materials. The job involves planning field and laboratory experiments and interpreting results. Facilities provided include laboratory rigs manned and maintained by trained engineers. Ample ancillary services also available. Company vehicles are used for the field testing of bearings, and the results of such tests, together with service experience in customers' engines, provide a rich source of data. Besides this fundamental work, *ad hoc* problems arise from time to time which bring the Metallurgist into contact with Company Production Managers and Engineers and also with fellow Metallurgists in customer firms.

   Candidates should preferably have an honours degree in Metallurgy and be familiar with standard metallographic techniques. The appointment will be made at a STARTING SALARY within the range either £800–£1200 p.a. or £1200–£1600 p.a., according to experience and qualifications. The post offers satisfying work and good career opportunities for a man wanting to do fundamental research who likes the experience of seeing his results put into practice.

2. In the other post, the occupant will be required to take part in a development programme which has been planned for the production of a new bearing material. His duties will be to investigate specific problems concerning the metallurgical aspects of the manufacturing process. A degree or equivalent in either Metallurgy or Physics is required, together with at least two years post-graduate experience of metallurgical work. A STARTING SALARY of £900–£1100 p.a. will be paid.

Applications for either of these positions should be sent to the Personnel Director (Ref. MET), Glacier Metal Co., Ltd., Ealing Road, Alperton, Wembley, Mddx.

METALLURGIST (BASIC GRADE)

required by

THE ATOMIC WEAPONS RESEARCH ESTABLISHMENT, ALDERMASTON, BERKSHIRE

To assist in the management of a team engaged in the production of components in radio-active metals and to take part in the development of process techniques.

A.I.M. or exempting qualifications required. Applicants should have appropriate experience including process working of metals.

SALARY: £815 (at age 25)—£1110 (at age 34 or over)—£1270 p.a.

Contributory Superannuation Scheme. A house or assistance towards legal expenses on house purchase will be available for married officers living beyond daily travelling distance.

POSTCARDS for application forms to the Senior Recruitment Officer at above address. Please quote ref. B/1336/228.

THE COLLEGE OF AERONAUTICS

DEMONSTRATOR IN MATERIALS AND METALLURGY SECTION required, to assist in the supervision of laboratories for metallography, heat-treatment, and testing of steels and light alloys. Experience essential and L.I.M. qualification desirable. Excellent facilities available for research. Salary within scale £600 × £25 to £900 × £25 to £1000 per annum, dependent on qualifications and experience, with superannuation under F.S.S.U., and family allowance. Applications, giving full particulars and containing the names of three referees, to the Recorder, The College of Aeronautics, Cranfield, Bletchley, Bucks. Further particulars available.

THE COLLEGE OF AERONAUTICS

PHYSICIST/METALLURGIST required in Materials and Metallurgy Section to lead a research project on the fatigue properties of light alloys. Applicants should possess a good engineering or science degree or equivalent. Salary up to £1250 per annum, depending on qualifications and experience, with superannuation under F.S.S.U., and family allowance. Applications, giving full particulars and containing the names of three referees, to the Recorder, The College of Aeronautics, Cranfield, Bletchley, Bucks. Further particulars available.

THE COLLEGE OF AERONAUTICS

RESEARCH ASSISTANT required in Materials and Metallurgy Section for work associated with the fatigue of light alloys. Both laboratory and workshop experience desirable. Applicants with a good engineering qualification preferred. Salary up to £800 per annum, depending on qualifications and experience, with superannuation under F.S.S.U., and family allowance. Applications, giving full particulars and containing the names of three referees, to the Recorder, The College of Aeronautics, Cranfield, Bletchley, Bucks.

THE HUGHES-JOHNSON STAMPINGS, LTD., Langley Green, Nr. Birmingham, require one or two metallurgists with experience in the metallography of ferrous and non-ferrous alloys. The positions offer good immediate salaries and prospects. Work will be done in modern laboratories, and the usual superannuation scheme is in force.